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10/523,083	02/02/2005	Hartmut Benckert	3827.129	6378

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EXAMINER	
SRIRAMAN, NIKHIL	

ART UNIT	PAPER NUMBER
4165	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)
	10/523,083	BENCKERT ET AL.
	Examiner	Art Unit
	NIKHIL SRIRAMAN	4165

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *21-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *21-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *2/2/2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date *8/17/2005*.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

This non-final office action is in response to communications filed February 2, 2005. The preliminary amendments filed along with the application have been entered, with original claims 1-19 canceled, substitute claims 1-20 canceled, and claims 21-42 added. Therefore, claims 21-42 remain pending and have been considered below.

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 21-28 is rejected under 35 U.S.C. 102(e) as being anticipated by Rau et al. (hereinafter “Rau”).

The applied reference has a common assignee and inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e)

might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Regarding claim 21, Rau discloses a large manipulator with an articulated mast, which is linked to a mast base rotatable about a vertical axis on a chassis, the articulated mast having one end connected to the mast base with the other end being a free end ending in a mast tip (Fig. 1, items 19-22), the large manipulator comprising

at least three mast arms limitedly pivotable about respectively parallel horizontal articulation axis relative to the mast base or an adjacent mast arm via a respective drive unit (Fig. 2, items 23-27),

a control unit for actuating the drive units for mast movement, the control unit including a coordinate transformer that responds to guiding parameters for the mast tip or for an end hose located thereon, and to measured angular values that are determined by means of angle sensors on the mast arms for translation into articulation axis referenced movement signals for the drive units in accordance with predefined path/slew characteristics (Fig. 3, where controller 74 actuates driver units 80-85; coordinate transformer 77 responds to guiding parameters 64 and measured angles ε; [0026]-[0028]),

wherein geodetic angle sensors which determine geographically referenced angular values of the individual mast arms are disposed in a rigid manner on the mast arms ([0027] via “angle provider or controller 96”, Fig. 3, item 96; Note the Examiner

construes item 96 to be part of the hydraulic system connected to the mast arms and, therefore, to be disposed on the mast arms), and

wherein the coordinate transformer is acted upon by the measured angular values of the geodetic angle sensors ([0027] via “the angular changes achieved in this manner in the coordinate transformer 77 are compared in the position controller 92 wit the intended values provided by the angle provider or controller 96”).

Regarding claim 22, Rau further discloses the system above wherein the guiding parameters (r, h) for the mast tip or for an end hose are provided in a chassis-referenced coordinate system (control signals interpreted as cylinder coordinates phi, r, and h into predetermined clock pulses; Fig. 2 via "r" and "h").

Regarding claims 23-24, Rau further discloses the system above, wherein in addition a geodetic angle sensor is provided on the mast base and chassis for measurement of a geographically referenced angle value associated with the mast base and chassis respectively (Fig. 3 shows angle provider 96, while Fig. 2 discloses what angles are provided, of which angle measurement ψ associated with the mast base is reads on this claim).

Regarding claim 25, Rau further discloses the system above, wherein the geodetic angle sensors are tilt angle sensors responsive to the gravity of the earth ([0027] via angle signals for the rotation and tilt or inclination axis).

Regarding claim 26, Rau further discloses the system above, wherein the coordinate transformer includes a software routine for conversion of geographically referenced mast arm base angle values into articulation angles ([0027] via “software

module is in the form of a coordinate transformer 77. . . of which is the main task to transform the incoming control signal interpreted as cylinder coordinates Φ, r, h . . . wherein the drive units of the redundant articulated axis 28 to 32 of the articulated mast 22 are respectively operable or drivable).

Regarding claim 27, Rau further disclose the system above wherein the coordinate transformer includes a software routine for translating geographically referenced mast arm base angle values into chassis referenced cylinder coordinates for the mast tip or the end hose ([0027] via “software module is in the form of a coordinate transformer 77. . . of which is the main task to transform the incoming control signal interpreted as cylinder coordinates Φ, r, h; Fig. 2 via “r” and “h” show cylindrical based components for the mast tip or end hose).

Regarding claim 28, Rau further discloses the system above wherein the coordinate transformer includes a software routine for conversion of the guide or command value into guide articulation angles in accordance with a predetermined path/slew characteristic of the articulated mast ([0027]-[0029] via “software module in the form of a coordinate transformer 77 of which is it the main task to transform the incoming control signal . . . safety program 100 responsive to output data of the sensor 96 for controlling actuating elements 80 through 84”; Thus, the Examiner construes the conversion into guide articulation angles with consideration of safety features incorporating actuator elements to be in accordance with predetermined path characteristics of the articulated mast).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 29-32 are is rejected under 35 U.S.C. 103(a) as being unpatentable over Rau as applied to claim 21 above, and further in view of Egawa et al. (5,968,104).

Regarding claim 29, Rau discloses a large manipulator system, but fails to the system wherein a software routine (78) responsive to dynamic angle measurement values (~iv) for the dividing thereof into low frequency and high frequency angle measurement value
components.

However, Egawa et al. discloses a front control system for a construction machine (Figs. 1-2), wherein a software routine responsive to dynamic angle measurement values for the dividing thereof into low frequency and high frequency angle measurement value components (Fig. 7 via "high frequency component" and “low frequency component”; Col. 12, lines 6-67).

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to combine the large manipulator system as disclosed by Rau with a software routine as disclosed by Egawa et al. in order to avoid poor arm cylinder speed reliability (Egawa et al., col. 12, lines 52-67).

Regarding claim 30, Rau discloses a large manipulator system wherein the controller compares articulation axis based on the articulation angles and the articulation axes based guide articulation angles as set or desired values, and which are connected on the output side with an articulation axes based command or steering value controller for control of the driver units of the associated articulation axes ([0027] via “each articulation axis 28-32 is so controlled using software. . . the for increasing precision it is , besides his, possible to make use of correction data stored in the memory for compensation of lad-dependent deformation. The angular changes achieved in this manner are in the coordinate transformer 77 are compared in the position controller. . .”)

Rau fails to disclose the referenced control comparers, which are acted upon by the stationary or low frequency component of the articulation axes based articulation angles as instantaneous values.

Egawa et al. discloses the referenced control comparers, which are acted upon by the stationary or low frequency component of the articulation axes based articulation angles as instantaneous values (Fig. 7 via "high frequency component" and “low frequency component”; Col. 12, lines 6-67).

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to combine the comparer of the large manipulator system as disclosed by Rau with a software routine as disclosed by Egawa et al. in order to avoid poor arm cylinder speed reliability (Egawa et al., col. 12, lines 52-67).

Regarding claim 31, Rau further discloses the system above wherein a group of articulation axes based or referenced error value controllers, which are acted upon with the articulation axes of the articulation angle and which are connected to the signal inputs of the associated drive units of the articulation axes (28 through 32) with formation of an error magnitude input circuit ([0027] via “each articulation axis 28-32 is so controlled using software. . . the for increasing precision it is , besides his, possible to make use of correction data stored).

Rau fails to disclose the high frequency component in particular of the articulation axes is acted upon.

However, Egawa et al. discloses acting upon by the stationary or low frequency component of the articulation axes based articulation angles as instantaneous values (Fig. 7 via "high frequency component" and “low frequency component”; Col. 12, lines 6-67).

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to combine the acting upon the articulated axis in the large manipulator system as disclosed by Rau with a software routine as disclosed by Egawa et al. in order to avoid poor arm cylinder speed reliability (Egawa et al., col. 12, lines 52-67).

Regarding claim 32, Rau further discloses the large manipulator system above wherein the error magnitude controllers are preceded by a software routine responsive to the geographically referenced angle measurement values and the articulation angles for determining the articulation axes based of the articulation angles (Fig. 3 via Safety

Program constitutes a software routine preceding the error magnitude controllers and is responsive to geographically referenced angle measurements).

Rau fails to disclose the software routine is responsive to the high frequency summed component of the articulation angles for determining the articulation axes based high frequency component ($\sim v^{H)}$ of the articulation angles.

However, Egawa et al. discloses software responsive to the high frequency summed component of the articulation angles (Fig. 7 via "high frequency component" and “low frequency component”; Col. 12, lines 6-67).

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to combine the acting upon the articulated axis in the large manipulator system as disclosed by Rau with a software routine as disclosed by Egawa et al. in order to avoid poor arm cylinder speed reliability (Egawa et al., col. 12, lines 52-67).

6. Claims 33-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rau et al. (2004/0076503A1) in view of Kleffner (2001/0045032A1).

Regarding claim 33, Rau discloses a large manipulator comprising:

a chassis, a mast base on the chassis, an articulated mast linked to the mast base and rotatable about a vertical axis, the articulated mast having a free end ending in a mast tip and comprising at least three mast arms limitedly pivotable about respectively parallel horizontal articulation axis relative to the mast base or an adjacent mast arm via a respective drive unit (see claim 21 above),

a control unit for actuating the drive units for mast movement, the control unit including a coordinate transformer which responds to guiding

parameters for the mast tip or for an end hose located thereon and to measured angular values that are determined by means of angle sensors on the mast arms for translation into articulation axis referenced movement signals for the drive units in accordance with predefined path/slew characteristics (see claim 21 above),

Rau fails to disclose a GPS-module is rigidly provided on each mast arm for determining the geographically referenced position measurement value of the individual mast arms, and wherein the coordinate transformer is acted upon by the position measurement values of the GPS module.

However, Kleffner discloses a GPS-module is rigidly provided on each mast arm for determining the geographically referenced position measurement value of the individual mast arms. (Fig. 1, [0040]).

Therefore, it would have been obvious to one having ordinary skill at the time of the invention to combine the manipulator as disclosed by Rau with a GPS device rigidly disposed each mast arm as disclosed by Kleffner in order to avoid problems associated with knowing the position of the mast arm.

Regarding claim 34, see claim 22 above.

Regarding claim 35 and 36, see claim 23 above.

Regarding claim 37, see claim 26 above

Regarding claim 38, see claim 28 above.

Regarding claim 39, see claim 29 above.

Regarding claim 40, see claim 30 above.

Regarding claim 41, see claim 31 above.

Regarding claim 42, see claim 32 above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to NIKHIL SRIRAMAN whose telephone number is (571)270-5797. The examiner can normally be reached on Monday through Friday, 7:30am-5:00pm, with every other Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Khoi Tran can be reached on 571-272-6919. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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